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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,149	09/24/2003	Joseph Phillip Bigus	YOR920030271US1	7384

35526 7590 07/16/2007

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ART UNIT	PAPER NUMBER
2129	

MAIL DATE	DELIVERY MODE
07/16/2007	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/670,149
Filing Date: September 24, 2003
Appellant(s): BIGUS ET AL.

Theodore D. Fay III
(Reg. No. 48,504)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 12, 2007 appealing from the Office action mailed November 22, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Arnold et al, U. S. Patent No. 5,822,301.

Bigus, J. P. "Applying Neural Networks to Computer System Performance Tuning", Neural Networks, 1994. IEEE World Congress on Computational Intelligence, IEEE International Conference on, 27 Jun-2 Jul 1994, vol. 4, pages: 2442-2447.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

CLAIM REJECTIONS - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1-5, 7-13, 15-21, and 23-24** are rejected under 35 U.S.C. 102(b) as being anticipated by Arnold et al, U.S. Patent No. 5,822,301, hereafter Arnold.

Claim 1

Arnold teaches a computer-implemented method of determining a health of a computing system component, the computer-implemented method comprising:

generating *at least one* fuzzy data set associated with *at least one* measured metric of the computing system component, wherein the fuzzy data set defines fuzzy regions indicating different categories of the measured metric (*col. 3, lines 22-46, Figs. 3-5*);

generating *at least one* fuzzy rule set associated with the *at least one* measure metric, wherein the fuzzy rule set defines a relationship of the fuzzy regions of the fuzzy data set to

categories of computing system component health (*col. 3, lines 22-46, col. 9, lines 29-56, Figs. 3-5*); and

outputting (not further defined, generating statements, C4 and generating numbers that indicate condition, C8 read on outputting) the health (at least *respective condition reads on health)* of the computing system component based on the at least one fuzzy data set and the at least one fuzzy rule set (*col. 4, lines 8-14, specifically lines 11-12 where it stated "a reliable statement about the respective condition of the network"; col. 8, lines 8-17*).

Claim 2

Arnold teaches the method of claim 1, wherein the at least one fuzzy data set is generated by performing data mining on metric history data, wherein the metric history data includes measured values for the at least one measure metric for a predetermined period of time (*col. 4, lines 23-53*).

Claim 3

Arnold teaches the method of claim 2, wherein the data mining includes performing statistical analysis of the metric history data to determined the distribution of the metric history data (*col. 2, lines 36-46*).

Claim 4

Arnold teaches the method of claim 1, further comprising:

generating at least one second fuzzy rule set indicating a relationship of the health of the computing system component to the health of at least one other computing system component (col. 4, lines 22-44) .

Claim 5

Arnold teaches the method of claim 1, further comprising:

generating an indicator of the health of the at least one computing system component (col.8, lines 8-17); and

outputting the indicator (col. 8, lines 8-17).

Claim 7

Arnold teaches the method of claim 1, wherein determining the health of the computing system component based on the at least one fuzzy data set and the at least one fuzzy rule set includes:

applying the at least one fuzzy rule set to metric data collected by a metric data collection facility (*col. 3, lines 22-46*); and

determining a fuzzy data set in which the metric data is classified based on an application of the at least one fuzzy rule set (*col. 3, lines 22-46*).

Claim 8

Arnold teaches the method of claim 7, wherein the at least one fuzzy rule set includes at least one hedge and wherein

determining a fuzzy data set in which the metric data is classified includes applying at least one hedge algorithm associated with the at least one hedge to metric data (col. 8, *col. 9, lines 29-56, Figs. 3-5*).

Claims 9-13 and 15-16, this is a software version of the claimed method discussed above, in claims 1-5 and 7-8, wherein all claimed limitations have also been addressed and cited as set forth above.

Claims 17-21 and 23-24, this is an apparatus version of the claimed method discussed above, in claims 1-5 and 7-8, wherein all claimed limitations have also been addressed and cited as set forth above.

CLAIM REJECTIONS - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims **25-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold as applied to claims 1-5 and 7-8, claims 9-13 and 15-16, claims 17-21 and 23-24 above, and further

in view of "Applying Neural Networks to Computer System Performance Tuning" by Joseph P. Bigus, hereinafter Bigus.

Arnold teaches a method of determining a health of a computing system component but fails to disclose at least one measured metric is selected from the group consisting of processor utilization, page fault rates, number of threads, number of hits on a website, number of database queries, number of database connections, and combinations thereof.

Bigus teaches computer system performance tuning using key system performance measures such as device utilizations and paging rates (Bigus, abstract).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to combine the method of determining a health of a computing system component of Arnold with the key system performance measures of Bigus.

The motivation for doing so would be to maximize system efficiency (Bigus, page 2442, left column, line 20).

(10) Response to Argument

1. **Rejection of claims 1-5, 7-13, 15-21, and 23-24 under 35 U.S.C. § 102(b):**

A. Rejection of claims 1-5, 7, 9-13, 15, 17-21, and 23

Claim 1 is a representative claim of this grouping of claims.

Argument 1

Arnold does not anticipate claim 1 because *Arnold* does not teach either of the features "generating at least one fuzzy data set associated with at least one measured metric of *the computing system component,*" or "outputting the health of the *computing system component* based on the at least one fuzzy data set and the at least one fuzzy rule set," as recited in claim 1.

Nothing in the cited portions of *Arnold* or any other portion of *Arnold* teaches or discloses the features, "generating at least one fuzzy data set associated with at least one measured metric of *the computing system component,*" or "outputting the health of the *computing system component* based on the at least one fuzzy data set and the at least one fuzzy rule set." *Arnold* teaches that communication connections can be evaluated using fuzzy rule sets. At least one measured value describing the connection is acquired. The measured value is then processed with fuzzy logic. Potential communications connections are then evaluated and selected based on the optimum fuzzy logic evaluation.

However, this teaching of *Arnold* differs from the claimed step of "determining the health of the computing system component based on the at least one fuzzy data set and the at least one fuzzy rule set," because this claimed step determines the health of a computing system component. In *Arnold,* the fuzzy logic is used to evaluate different communication connections. However, a communication connection as in *Arnold* is not the same as a computing system, as claimed. Likewise, the health of a computing system, as claimed, is not the same as evaluating the quality of a communications connection, as in *Arnold.*

> While the Examiner sets forth the correct standard for examination of the claims under *In re Morris*, the Examiner fails to correctly apply that standard. Key to the evaluation under *In re Morris* is whether the interpretation that the Examiner subscribes to the claims is consistent with the teaching of the specification. The Examiner has gone beyond the teachings of the specification in including the communications networks of *Arnold* within the scope of claim 1.
>
> A network simply is not a device as in claim 1. While a network may be comprised of a number of different devices, the network itself is an amorphous collection of these devices and their interconnections. Thus, while a device may be part of a network, the "communication network" is not a computing device. To use the example of *Arnold*, a computing device is not the Internet. *Arnold's* "communication network" is therefore inconsistent with Applicant's teaching in the specification regarding what comprises a "computing system."

In summary, appellants mainly argued that "computing system component" and "the health of a computing system" as claimed are not the same as "a communication connection" and "evaluating the quality of a communications connection" in Arnold.

In response, the examiner disagrees. Appellants are reminded that during patent examination Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs, Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (**claims**

must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969) (Emphasis added).

Examiner applied correctly the standard above and has not gone beyond the teachings of the specification as appellants asserted since appellants' field of invention relates to computing system. Examiner applied prior art found in the same field of endeavor. Moreover, since the terms "computing system component" and "the health of a computing system" were not further defined in the claims, the applied art still reads on the claimed invention.

Examiner notes that the plain, ordinary, and accustomed meaning of the term "computing system" generally corresponds to a system containing one or more computers. Examiner asserts the communication connections in communication network of Arnold to read on a computing system component of appellants since the communication networks are complex systems that contain several thousand components i.e. computers.

Regarding the "health of a computing system", Examiner also notes that the plain, ordinary, and accustomed meaning of the term "health" generally corresponds to a state of well-being of a person if it is used to apply to human being, or an overall

condition of a machine, a system, or in the instant case a computing system. Examiner asserts Arnold teaches in col. 4, lines 8-14, specifically lines 11-12 where it stated "a reliable statement about the respective condition of the network" to read on "the health of a computing system." Outputting which was not further defined reads on generating statements, Col. 4 and generating numbers that indicate condition, Col. 8. At least *respective condition col. 4 and 8 reads on health.* Although the examiner has cited a few portions of the reference, the appellant should have read the entire reference and understood how Arnold (at least cols. 3-8) clearly disclose measuring network/computer data/parameters with fuzzy logic (col. 3, lines 22-45), and outputting and making decisions based on the fuzzy rule set (col. 5 even specifies how decisions are output for routing decisions to be made).

On this basis, Examiner asserts Arnold anticipated the argued limitations. Therefore, the rejection STANDS.

Argument 2

> As shown above, *Arnold's* network is not the Applicant's computing system. Furthermore, *Arnold's* "condition of the network" is not consistent with the Applicant's "health of the computing system."
>
> The "condition of the network" comprises several variables, all of which are related to the elapsed

> time and reliability for sending packets from one network device to another.
>
> Thus *Arnold's* "condition of the network" only teaches time and reliability of the network connections. That is, the "condition of the network" is concerned with the interconnections between the various network nodes. On the other hand, the Applicant's health of the computer system comprises processor workload type metrics, and is not concerned with the network speed and reliability of *Arnold*. **As stated in the specification, Applicant's workload type metrics include**, for example, processor utilization, page fault rates, number of threads, number of hits on a web site, number of database queries, number of database connections, and other similar metrics indicating the workload and/or resource utilization of the computer system. While these features are not explicitly claimed in claim 1, the description in the specification shows that the Examiner's interpretation of claim 1 is not consistent with the specification (Emphasis added).

In summary, appellants mainly argued that appellants' heath of the computing system comprises processor workload type metrics, and is not concerned with the network speed and reliability of Arnold.

In response to appellants' argument, there is no mention of these limitations in the claims and the specification is not the measure of the invention. Therefore, limitations contained therein can not be read into the claims for the purpose of avoiding the prior art; see In re Sprock, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968).

Regarding the "health of a computing system", Examiner also notes that the plain, ordinary, and accustomed meaning of the term "health" generally corresponds to a state of well-being of

a person if it is used to apply to human being, or an overall condition of a machine, a system, or in the instant case a computing system. Examiner asserts Arnold teaches in col. 4, lines 8-14, specifically lines 11-12 where it stated "a reliable statement about the respective condition of the network" to read on "the health of a computing system." Although the examiner has cited a few portions of the reference, the appellant should have read the entire reference and understood how Arnold (at least cols. 3-8) clearly disclose measuring network/computer data/parameters with fuzzy logic (col. 3, lines 22-45), and outputting and making decisions based on the fuzzy rule set (col. 5 even specifies how decisions are output for routing decisions to be made).

On this basis, Examiner asserts Arnold anticipated the argued limitations. Therefore, the rejection STANDS.

B. Rejection of claims 8, 16, and 24

Claim 8 is a representative claim of this grouping of claims.

Argument 3

> Additionally, *Arnold* does not anticipate claim 8 because *Arnold* does not teach the feature "wherein the at least one fuzzy rule set *includes at least one hedge* and wherein determining a fuzzy data set in

> which the metric data is classified includes *applying at least one hedge algorithm* associated with the at least one hedge to metric data," as recited in claim 8.
>
> Nothing in the cited portions of *Arnold* or any other portion of *Arnold* teaches or discloses the features, "wherein the at least one fuzzy rule set *includes at least one hedge* and wherein determining a fuzzy data set in which the metric data is classified includes *applying at least one hedge algorithm* associated with the at least one hedge to metric data." *Arnold* teaches that formulation of fuzzy rule sets "is a heuristic and subjective event." The heuristic determination of *Arnold* - *a* trial-and-error method of problem solving used when an algorithmic approach is impractical - is on its face contrary to the plain language of claim 8. Rule formulation as claimed in claim 8 is instead governed by very predictable hedge algorithms. The use of these algorithms is the antithesis of the trial-and-error method disclosed in the cited portion of *Arnold*.
>
> Because classifying metric data from the fuzzy data by applying at least one hedge algorithm is not the same as "a heuristic and subjective" determination of the rules, *Arnold* does not teach all of the features of claim 8. Furthermore, *Arnold* does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. Indeed, *Arnold* directly teaches away from the use of algorithms, instead relying on trial and error to formulate the evaluation rules. Because the reference fails to show that every element of the claimed invention is identically shown in that reference, the rejection of claim 8 under 35 U.S.C. § 102 is in error. Thus, *Arnold* does not anticipate claim 8 or any other claim in this grouping of claims.

In summary, appellants mainly argued that Arnold does not teach "wherein the at least one fuzzy rule set ***includes at least one hedge***" and "***applying at least one hedge algorithm***" (emphasis added).

In response to appellants' argument, examiner asserts Arnold teaches "wherein the at least one fuzzy rule set includes at least one hedge" at col. 8, col. 9, lines 29-56 and also Figs. 3-5. Arnold describes at col. 8, lines 37-50 "Fig. 3 recites an example of the affiliation function of the linguistic variables of capacity. Five fuzzy sets, "VL" (very low, "LOW", "MED", "HIGH", and "VH" (very high) …evaluation." Examiner asserts Arnold's affiliation functions "LOW", "MED", "HIGH" to read on fuzzy rule sets of appellants, and "very" to read on hedge of appellants.

Arnold teaches "applying at least one hedge algorithm" at col. 9, lines 29-56, specifically "the formulation of the rules is a heuristic … evaluated." Since appellants have not disclosed nor claimed any particular algorithm, examiner chose one. Heuristic means an algorithm.

On this basis, Examiner asserts Arnold anticipated the argued limitations. Therefore, the rejection STANDS.

2. **Rejection of claims 25-27 under 35 U.S.C. 103(a)**

Claim 25 is a representative claim of this grouping of claims.

Argument 4

The proposed combination does not teach each claim feature.
The Examiner failed to state a *prima facie* obviousness rejection because neither *Arnold* nor *Bigus* teach or suggest all features of claim 1, from which claim 25 depends. As discussed above, *Arnold* does not teach either of the claimed features of "generating at least one fuzzy data set associated with at least one measured metric of *the computing system component,*" or "outputting the health of the *computing system component* based on the at least one fuzzy data set and the at least one fuzzy rule set." *Bigus* teaches the applying feedforward neural networks and techniques from control systems theory to computer system performance tuning. *Bigus* does not teach or disclose "generating at least one fuzzy data set associated with at least one measured metric of *the computing system component,*" or "outputting the health of the *computing system component* based on the at least one fuzzy data set and the at least one fuzzy rule set." Therefore, *Bigus* does not overcome the deficiencies of *Arnold*.

Therefore, the proposed combination of *Arnold* and *Bigus*, when considered as a whole, does not teach or suggest the features of claim 25. Neither reference teaches nor suggests "generating at least one fuzzy data set associated with at least one measured metric of *the computing system component,*" or "outputting the health of the *computing system component* based on the at least one fuzzy data set and the at least one fuzzy rule set." Because the proposed combination of the references, when considered as a whole, does not teach or suggest all of the features of claim 25, the Examiner has failed to state a *prima facie* obviousness rejection against claim 25 and against the remaining claims in this grouping of claims.

In response to appellants' argument that Examiner failed to state a prima facie obviousness rejection because neither Arnold nor Bigus teach or suggest all features of claim 1, from which claim 25 depends.

Arnold anticipated appellants' claim 1 as rejected above and Examiner has also responded to appellants' argument regarding claim 1 in argument 1 and argument 2. Therefore, the proposed combination of Arnold and Bigus is proper.

On this basis, the rejection STANDS.

Argument 5

> No teaching, suggestion, or motivation exists to combine the references.
> The references themselves do not suggest the proposed advantage. In the present case, neither *Arnold* nor Bigus teach incorporating the parameter measurements of *Bigus* into the network communication evaluations of *Arnold*. Furthermore, the Examiner has not stated any alternative motivation for combining the references based on the general understanding of one of ordinary skill in the art. Accordingly, the Examiner has not actually stated a teaching or suggestion based on the references to combine the references. Instead, the Examiner has only put forth a hypothetical advantage of combining the references based on the Examiner's opinion, rather than on a pre-existing teaching, suggestion, or motivation found in the references themselves. Thus, the Examiner has failed to state a *prima facie* obviousness rejection against claim 25 and against any other claim in this grouping of claims.

In response to appellants' argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or

in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In response to Applicant's argument that there is no suggestion to combine the references, the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of references. In re Nomiya, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is not what individual references themselves suggest but rather what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re Keller, 648 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Sernaker, 702 F.2d 989, 217 USPQ 1 (Fed. Cir. 1983); In re McLaughlin, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA 1969).

In this case, the motivation to combine Arnold and Bigus would be to maximize system efficiency (Bigus, page 2442, left column, line 20).

Argument 6

> No motivation exists to combine Arnold and Bigus because they address different problems.
>
> One of ordinary skill would not combine the references to achieve the invention of claim 25 because the references are directed towards solving different problems. It is necessary to consider the reality of the circumstances - in other words, common sense - in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor. *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1992); *In re*

> *Wood*, 599 F.2d 1032, 1036, 202 U.S.P.Q. 171, 174 (CCPA 1979). In the case at hand, the cited references address distinct problems. Thus, no common sense reason exists to establish that one of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor. Accordingly, no teaching, suggestion, or motivation exists to combine the references and the Examiner has failed to state a *prima facie* obviousness rejection of claim 25.
>
> For example, *Bigus is* directed to solving the problem of applying feedforward neural networks and techniques from control systems theory to computer system performance tuning, and specifically whether neural networks can be successfully used to adapt the memory partition sizes of an operating system.
>
> Based on the plain disclosures of the references themselves, the references address completely distinct problems that are unrelated to each other. The problem of successfully using neural networks to adapt to the memory partition sizes of an operating system as described in Bigus is completely distinct from the problem of evaluating communication connections in multi-node networks as described in *Arnold*.
>
> Because the references address completely distinct problems, one of ordinary skill would have no reason to combine or otherwise modify the references to achieve the invention of claim 25. Thus, no proper teaching, suggestion, or motivation exists to combine the references in the manner suggested by the Examiner. Accordingly, the Examiner has failed to state a prima facie obviousness rejection against claim 25 and against any other claim in this grouping of claims.

In response to appellants' argument that no motivation exists to combine Arnold and Bigus because they address different problems, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as

a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Arnold and Bigus are directed to computing system and using measured metrics to evaluate its performance.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Mai T. Tran/

July 2, 2007

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